

Remarks

[0001] Herein, the "Action" or "Office Action" refers to the final Office Action dated June 22, 2007.

[0002] Applicant respectfully requests reconsideration and allowance of all pending claims of the application. Claims 1-9 and 11-37 are presently pending. Claims 1, 11, 15, and 27 are amended herein. Support for the amendments can be found at least at pages 11-12 and at Figs. 1-4 of the specification as-filed. Claim 10 is canceled herein. No new claims are added herein.

[0003] Applicant's amendments and remarks after Final are appropriate under 37 C.F.R. §1.116 because they address the Office's remarks in the Final Action, and thus could not have been presented earlier. In addition, the amendments and remarks should be entered to place the case in better form for appeal.

Substantive Claim Rejections

35 USC § 112 Claim Rejections

[0004] Claims 9-11, 23-24, and 34-36 are rejected under 35 USC §112 first paragraph as failing to comply with the enablement requirement (*Office Action*, p.5). More specifically, the Examiner indicates that the specification gives no information on how to combine the different signals without destroying the watermark or hiding the watermark so that it is undetectable among the omnibus mixed signal (*Office Action*, p.5).

[0005] Claim 10 is canceled herein, accordingly the §112 rejection of claim 10 is moot. Applicant respectfully traverses the remaining §112 rejections, and requests reconsideration and allowance in light of the comments and amendments contained herein, and in view of §1.132 declaration submitted herewith.

[0006] Applicant acknowledges that if the mixing of the signal destroyed the watermark it may be undetectable in the omnibus mixed signal. However, Applicant notes that the claims are not directed to methods for combining the different signals without destroying or hiding the watermark. Instead, the claims describe obtaining an omnibus signal (which may or may not include an embedded signal) and then testing the omnibus signal to determine if at least one of the multiple streams of the omnibus signal includes an embedded signal therein. As reproduced below, the specification at page, 12 lines 1-9 clearly indicate that the described detection of the watermark assumes that mixing of the signals does not destroy the watermarks embedded therein, and states:

If no watermark is detected in the omnibus mixed signal, then that means that none of the original unmixed input signals (*e.g.*, 310-318) have a watermark embedded therein. If it does indeed detect a watermark, then that means that at least one of the original unmixed input signals (*e.g.*, 310-318) includes a watermark.

Of course, this assumes that mixing the signals does not destroy the watermarks embedded therein. Watermarks are typically designed to remain intact after purposeful attacks by pirates. Therefore, it is reasonable to assume that these watermarks are sufficiently robust to withstand mixing. (Specification, p.12 Ins.1-9).

[0007] As described in the specification, watermarks are typically designed to be sufficiently robust to remain intact after purposeful attacks by pirates, and as a result of this robust nature watermarks may withstand mixing.

[0008] Applicants have submitted a **\$1.132 declaration** along with this response to support adequacy of the application disclosure. More specifically, the declaration submitted along with the response is made by the first named inventor, and provides additional factual evidence to support the position that a person of ordinary skill in the art at the time of the invention would know that watermarks can be robust enough to withstand a mixing of signals to form an omnibus signal, and that assuming the watermark is not destroyed by the mixing of signals, one can detect the watermark in within the omnibus signal.

[0009] In view of the declaration, and the comments herein, Applicant submits that each of the rejected claims is adequately enabled

by the disclosure. Accordingly, for at least these reasons, Applicant respectfully requests that the §112 rejections be withdrawn and that the case be passed along to issuance

35 U.S.C. §102 Claim Rejections

[0010] Claims 1-2, 4-8, 12-14, 15-16, 18-22, 25-28, 30-33, and 37 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,442,285 to Rhoads et al. (hereinafter, "Rhoads") (*Office Action*, p.6).

[0011] Claims 1, 3, 9-11, 15, 17, 23-24, 27, 29, and 34-36 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application Publication No. 2003/0063570 to Katayama et al. (hereinafter, "Katayama") (*Office Action*, p.8).

[0012] Claim 10 is canceled herein, accordingly the §102 rejection of claim 10 is moot. Applicant respectfully traverses the remaining §102 rejections, and requests reconsideration and allowance in light of the comments and amendments contained herein. Accordingly, Applicant requests that the rejections be withdrawn and that the case be passed along to issuance.

[0013] Claim 1 recites a computer-readable medium having a program module with computer-executable instructions that, when executed by a computer, performs a method comprising:

obtaining an omnibus signal comprising multiple input signals received from multiple different sources and mixed together, wherein when the omnibus signal is obtained it is unknown whether at least one of the input signals includes an embedded signal therein;

testing the omnibus signal comprising the multiple input signals with a detector which views the multiple input signals of the omnibus signal as a single continuous stream which is to be examined for the presence of an embedded signal, and determining that one of the multiple input signals of the omnibus signal includes an embedded signal therein; and

performing a tree-search of a tree-like organizational structure which represents the multiple input signals of the omnibus signal to locate which of the multiple input signals has the embedded signal therein.

§102 Rejection of Claim 1 - based on Rhoads

[0014] In order for Rhoads to anticipate this claim, Applicant submits that Rhoads must disclose each and every element and feature of the claim and that they must be arranged in the same manner as the claim. Applicant respectfully submits that Rhoads does not disclose all of the claimed elements and features of claim 1. For example, Rhoads does not show or disclose "testing the omnibus signal comprising the multiple input signals with a detector which views the multiple input signals of the omnibus signal as a single continuous stream which is to be examined for the presence of an embedded signal, and determining that one of the multiple input signals of the omnibus signal includes an embedded signal

therein" and then "performing a tree-search of a tree-like organizational structure which represents the multiple input signals of the omnibus signal to locate which of the multiple input signals has the embedded signal therein" as recited in claim 1.

[0015] Instead, Rhoads describes methods, devices and systems for controlling operations of a device using a reconfigurable water-mark detector since it may be useful to be able to change the operation of a watermark detector (*Rhoads*, Col.1 Ins.45-53). Such changes may include how the watermark detector decodes or interprets a watermark embedded in a signal of a given media type (*Rhoads*, Col.1 Ins.50-53). The capability to reconfigure the watermark detector reduces or prevents the devices and software from becoming obsolete when changes to the watermark detector are needed (*Rhoads*, Col.1 Ins.53-58). Rhoads describes that it may also be advantageous to be able to reconfigure a watermark detector when the watermark technology provider wants to incorporate new features into the watermark detector, expand the payload of the watermark, or change how the watermark payload is interpreted (*Rhoads*, Col. 1, lines 61-65).

[0016] Rhoades describes that a watermark embedded in a signal of a given media type can include a command signal which can be used to trigger a change in operation of the watermark detector (*Rhoads*, Col. 2, lines 5-10). The described method changes the operation of the watermark detector based on the command signal (*Rhoads*, Col. 2, lines 7-10). This change may include changing how the watermark detector

decodes or interprets a watermark in a signal of a media type (Rhoads, Col. 2, lines 8-11). After changing the operation of the watermark detector, the method decodes a usage control restriction from the watermark embedded in the signal (*Rhoads*, Col. 2, lines 5-13).

[0017] Rhoades describes various possible uses of a watermark. The possible uses include such things as pre-authorizing a track of music for specific types of use, controlling usage (number of permitted playbacks), providing rating which indicate age-appropriateness of the content, a date indicator, and technical playback parameters (*Rhoads*, Cols. 6-7). Rhoades also describes a "capture" button which a user may select when the user hears a song playing, and wants to record and keep the song (Rhoads, Col. 8, lines 16-30). In response to the user's selection, a radio device decodes a watermark embedded in the music, and thereby determines the identity of the music (*Rhoads*, Col. 8, lines 16-30). The user's radio can then make a wireless transmission identifying the user and the desired song (identified by the watermark) so that the song can be sold/transmitted to the user (*Rhoads*, Col. 8, lines 16-30).

[0018] To support its assertion of anticipation, the Office cites to column 10 line 65 to column 11 line 1 of Rhoads (*Office Action* p.3; *Rhoads*, col.10 ln.65-col.11 ln.1). The cited section describes that a watermark detector can be included as part of the operating system of Rhoads, to monitor Internet data which is received by the user's computer, for the presence of watermarks (*Rhoads*, col.10 ln.65-col.11 ln.1). The Office then argues that the monitoring of Internet data for the presence of

watermarks as described in Rhoads is equivalent to the testing of the omnibus signal recited in the claim, since the monitoring is of IP packets received from different sources.

[0019] However, Rhoads does not show or disclose "testing the omnibus signal comprising the multiple input signals with a detector which views the multiple input signals of the omnibus signal as a single continuous stream which is to be examined for the presence of an embedded signal, and determining that one of the multiple input signals of the omnibus signal includes an embedded signal therein", as recited in claim 1. Instead, of describing testing the omnibus signal with a detector which views the multiple input streams of the omnibus signal as a single continuous stream, Rhoads describes monitoring packetized Internet data (*e.g.*, TCP/IP data) which is received by the user's computer.

[0020] Further, Rhoads does not show or disclose "performing a tree-search of a tree-like organizational structure which represents the multiple input signals of the omnibus signal to locate which of the multiple input signals has the embedded signal therein", as recited in claim 1. Rhoads says nothing about a tree-like organizational structure which represents the multiple input signals of the omnibus signal, or about performing a tree-search of a tree-like organizational structure which represents the multiple input signals of the omnibus signal to locate which of the multiple input signals has the embedded signal therein, as recited in claim 1. Instead, Rhoads simply describes that a watermark detector can be included as part of the operating system to monitor Internet data which is

received by the user's computer, for the presence of watermarks (*Rhoads*, col.10 ln.65-col.11 ln.1).

[0021] Accordingly, claim 1 is allowable over Rhoads for at least these reasons, and Applicant respectfully requests that the §102 rejection be withdrawn.

[0022] **Claims 2, 4-8, and 12-14** are allowable by virtue of their dependency upon claim 1 (either directly or indirectly). Additionally, some or all of claims 2, 4-8, and 12-14 may be allowable over Rhoads for independent reasons. For example:

[0023] **Claim 11** as amended recites in part "wherein performing the tree search further comprises "walking" up the tree-like organizational structure and testing the signal at each "branch" or "leaf" encountered in the walk up the tree-like organizational structure to determine if the signal at that branch or leaf includes an embedded signal therein." Rhoads does not show or disclose performing a tree-search of a tree-like organizational structure which represents the multiple input signals of the omnibus signal to locate which of the multiple input signals has the embedded signal therein, "wherein the performing the tree search includes "walking" up the tree-like organizational structure and testing the signal at each "branch" or "leaf" encountered in the walk up the tree-like organizational structure to determine if the signal at that branch or leaf includes an embedded signal therein", as recited in claim 11.

\$102 Rejections of Claim 1 - based on Katayama

[0024] In order for Katayama to anticipate this claim, Applicant submits that Katayama must disclose each and every element and feature of the claim and that they must be arranged in the same manner as the claim. Applicant respectfully submits that Katayama does not disclose all of the claimed elements and features of claim 1. For example, Katayama does not show or disclose "obtaining an omnibus signal comprising multiple input signals received from multiple different sources and mixed together, wherein when the omnibus signal is obtained it is unknown whether at least one of the input signals includes an embedded signal therein", as recited in claim 1 (Emphasis Added).

[0025] Instead, Katayama describes a method for embedding specific data (*i.e.*, an electronic watermark) into audio signals, or for updating specific data (*i.e.*, an electronic watermark) that has been embedded into audio signals using a minimum amount of operations (*Katayama* [0002]).

[0026] In rejecting the claims, the Office refers to paragraphs [0120] to [0186] of *Katayama* (*Office Action*, p.9). The cited paragraphs describe a third and a fourth embodiment of the invention of Katayama (*Office Action*, p.9; *Katayama* [0120]-[0186]).

[0027] Turning first to the third embodiment of Katayama (*Katayama* [0120]-[0165]). The third embodiment of Katayama provides examples of operations which can be used when a four input audio signal (4-channel input) is presented, and describes using a system based on the sums and

differences of signals to decrease the number of operations needed for adding an additional signal (*i.e.*, electronic watermark) to the four audio signals (*Katayama* [0162]). As part of the process described as *Katayama*'s third embodiment, a signal $\alpha_1 = A+B+C+D$ is output by the first operation means 102, and a signal addition means 103 adds a watermark to α_1 so that the output from the signal addition means 103 is $\alpha_1' = A+B+C+D+WM$, and then a signal detection means 203 extract the watermark (*Katayama* [0122]-[0138]).

[0028] Applicant submits that the third embodiment of *Katayama* does not show or disclose "obtaining an omnibus signal comprising multiple input signals received from multiple different sources and mixed together, wherein when the omnibus signal is obtained it is unknown whether at least one of the input signals includes an embedded signal therein", as recited in claim 1. In *Katayama* the described multiple input signals represent output from a stereo and are not described as being multiple input signals received from multiple different sources and mixed together (*Katayama* [0069]). Further, when the signal $\alpha_1 = A+B+C+D$ of *Katayama* is output, it is known that the signal does not include a watermark. In fact, *Katayama* specifically describes that a signal addition means 103 adds the watermark to α_1 so that the output from the signal addition means 103 is $\alpha_1' = A+B+C+D+WM$ (*Katayama* [0122]-[0138]). As such, *Katayama* does not show or disclose that "when the omnibus signal is obtained it is unknown whether at least one of the input signals includes an embedded signal therein", as recited in claim 1.

[0029] Turning now to the fourth embodiment of Katayama (*Katayama* [0166]-[0186]). The fourth embodiment of Katayama describes a reproduction apparatus 1002 which receives an audio signal embedded with a watermark, and then reproduces the watermark (*Katayama* [0168]). As part of the process, a channel selection means 1004 first obtains a certain channel from the audio signal that is input to the recording apparatus 1002 (*Katayama* [0169]). Which channel to select is specified by the channel-data-generation means 1005, and the channel specified can be any channel selected at random, or it is possible to specify an order in which the channels are to be sent (*Katayama* [0169]).

[0030] As part of the process described as Katayama's fourth embodiment, a reproduction apparatus 1002 receives an audio signal known to be embedded with a watermark, and then reproduces the watermark (*Katayama* [0168]). Applicant submits that the process described in Katayama's fourth embodiment is clearly not the same as "obtaining an omnibus signal comprising multiple input signals received from multiple different sources and mixed together, wherein when the omnibus signal is obtained it is unknown whether at least one of the input signals includes an embedded signal therein", as recited in claim 1.

[0031] Further, Katayama does not show or disclose "testing the omnibus signal comprising the multiple input signals with a detector which views the multiple input signals of the omnibus signal as a single continuous stream which is to be examined for the presence of an embedded signal, and determining that one of the multiple input signals of

the omnibus signal includes an embedded signal therein”, as recited in claim 1.

[0032] With regard to the third embodiment of Katayama, it does not show or disclose “testing the omnibus signal comprising the multiple input signals with a detector which views the multiple input signals of the omnibus signal as a single continuous stream which is to be examined for the presence of an embedded signal”, as recited in claim 1 (*Katayama* [0120]-[0165]). Instead, the third embodiment of Katayama simply describes extracting the watermark which had previously been added by the signal addition means 103 (*Katayama* [0122]-[0138]). As such, in the third embodiment of Katayama there is reason to test the omnibus signal for the presence of an embedded signal, since Katayama specifically describes that a signal addition means 103 has added the watermark to a1 (*Katayama* [0122]-[0138]). In other words, the watermark is known to be present.

[0033] With regard to the fourth embodiment of Katayama, it does not show or disclose testing the omnibus signal comprising the multiple input signals with a detector which views the multiple input signals of the omnibus signal as a single continuous stream which is to be examined for the presence of an embedded signal, as recited in claim 1 (*Katayama* [0166]-[0186]). Instead, Katayama’s fourth embodiment describes that a reproduction apparatus 1002 receives an audio signal known to be embedded with a watermark, and then reproduces the watermark (*Katayama* [0168]).

[0034] Further, Katayama does not show or disclose “performing a tree-search of a tree-like organizational structure which represents the multiple input signals of the omnibus signal to locate which of the multiple input signals has the embedded signal therein”, as recited in claim 1.

[0035] With regard to this element, the Office cites generally to paragraphs 120 to 186 of Katayama (*Office Action*, p.10; *Katayama* [0120]-[0165]). However, nowhere in the cited section does Katayama say anything about “performing a tree-search of a tree-like organizational structure which represents the multiple input signals of the omnibus signal to locate which of the multiple input signals has the embedded signal therein”, as recited in claim 1. Applicant requests that the Office point with specificity to such in Katayama or withdraw the rejection.

[0036] Accordingly, claim 1 is allowable over Katayama for at least these reasons, and Applicant respectfully requests that the §102 rejection be withdrawn.

[0037] **Claims 3, 9 and 11** are allowable by virtue of their dependency upon claim 1 (either directly or indirectly). Additionally, some or all of claims 3, 9 and 11 may be allowable over Katayama for independent reasons.

[0038] **Claim 15** recites a method for dynamic detecting of robust embedded-signals in a multiple-signal environment, the method comprising:

obtaining an omnibus signal comprising multiple input signals received from multiple different sources and mixed together, wherein when the omnibus signal is obtained it is unknown whether at least one of the input signals includes an embedded signal therein;

testing the omnibus signal comprising the multiple input streams with a detector which views the multiple input streams of the omnibus signal as a single continuous stream which is to be examined for the presence of an embedded signal, to determine if at least one of the multiple input streams of the omnibus signal includes an embedded signal therein,

wherein each of the multiple input signals of the omnibus signal may potentially have an embedded signal therein, the multiple signals being mixed together into the omnibus signal and in a tree-like organizational structure with each of the multiple input signals is a "leaf" in the tree-like organizational structure and each "leaf" represents one of the multiple input signals that is unmixed with other signals.

\$102 Rejection of Claim 15 - based on Rhoads

[0039] The Office rejects claim 15 based on similar rational as that set forth in the rejection of claims 1 (*Office Action*, pp.3 and 6). Applicant respectfully submits that based on argument similar to those presented above in response to the rejection of claim 1, Rhoads does not disclose all of the claimed elements and features of claim 15. For example, Rhoads does not show or disclose "testing the omnibus signal comprising the multiple input streams with a detector which views the multiple input streams of the omnibus signal as a single continuous stream which is to be

examined for the presence of an embedded signal, to determine if at least one of the multiple input streams of the omnibus signal includes an embedded signal therein, wherein each of the multiple input signals of the omnibus signal may potentially have an embedded signal therein, the multiple signals being mixed together into the omnibus signal and in a tree-like organizational structure with each of the multiple input signals is a "leaf" in the tree-like organizational structure and each "leaf" represents one of the multiple input signals that is unmixed with other signals", as recited in claim 15. For the sake of brevity, Applicant has not repeated the arguments.

[0040] Accordingly, claim 15 is allowable over Rhoads for at least these reasons, and Applicant respectfully requests that the §102 rejection be withdrawn.

[0041] **Claims 16, 18-22, and 25-26** are allowable by virtue of their dependency upon claim 15 (either directly or indirectly). Additionally, some or all of claims 16, 18-22, and 25-26 may be allowable over Rhoads for independent reasons.

§102 Rejections of Claim 15 - based on Katayama

[0042] The Office rejects claim 15 based on similar rational as that set forth in the rejection of claims 1 (*Office Action*, pp.4 and 8-9). Applicant respectfully submits that based on argument similar to those

presented above in response to the rejection of claim 1, Katayama does not disclose all of the claimed elements and features of claim 15. For example, Katayama does not show or disclose "testing the omnibus signal comprising the multiple input streams with a detector which views the multiple input streams of the omnibus signal as a single continuous stream which is to be examined for the presence of an embedded signal, to determine if at least one of the multiple input streams of the omnibus signal includes an embedded signal therein, wherein each of the multiple input signals of the omnibus signal may potentially have an embedded signal therein, the multiple signals being mixed together into the omnibus signal and in a tree-like organizational structure with each of the multiple input signals is a "leaf" in the tree-like organizational structure and each "leaf" represents one of the multiple input signals that is unmixed with other signals", as recited in claim 15. For the sake of brevity, Applicant has not repeated the arguments.

[0043] Accordingly, claim 15 is allowable over Katayama for at least these reasons, and Applicant respectfully requests that the §102 rejection be withdrawn.

[0044] **Claims 17 and 23-24** are allowable by virtue of their dependency upon claim 15 (either directly or indirectly). Additionally, some or all of claims 17 and 23-24 may be allowable over Katayama for independent reasons.

[0045] Claim 27 recites:

An embedded-signal detection system comprising a single embedded-signal detector configured to receive an omnibus mixed signal which includes multiple input signals that have been received from multiple different sources and mixed together, wherein when the omnibus signal is received by the detector it is unknown whether at least one of the input signals includes an embedded signal therein, and wherein the detector is further configured to concurrently test the multiple input signals of the omnibus signal as a single continuous stream which is to be examined for the presence of an embedded signal, to determine if at least one of the multiple input signals of the omnibus mixed signal includes an embedded signal therein.

§102 Rejection of Claim 27 - based on Rhoads

[0046] The Office rejects claim 27 based on similar rational as that set forth in the rejection of claims 1 (*Office Action*, pp.3 and 8). Applicant respectfully submits that based on argument similar to those presented above in response to the rejection of claim 1, Rhoads does not disclose all of the claimed elements and features of claim 27. For example, Rhoads does not show or disclose "[a]n embedded-signal detection system comprising a single embedded-signal detector configured to receive an omnibus mixed signal which includes multiple input signals that have been received from multiple different sources and mixed together, wherein when the omnibus signal is received by the detector it is unknown whether at least one of the input signals includes an embedded signal therein, and wherein the detector is further configured to concurrently test the multiple

input signals of the omnibus signal as a single continuous stream which is to be examined for the presence of an embedded signal, to determine if at least one of the multiple input signals of the omnibus mixed signal includes an embedded signal therein", as recited in claim 27. For the sake of brevity, Applicant has not repeated the arguments.

[0047] Accordingly, claim 27 is allowable over Rhoads for at least these reasons, and Applicant respectfully requests that the §102 rejection be withdrawn.

[0048] **Claims 28, 30-33, and 37** are allowable by virtue of their dependency upon claim 27 (either directly or indirectly). Additionally, some or all of claims 28, 30-33, and 37 may be allowable over Rhoads for independent reasons.

§102 Rejections of Claim 27 - based on Katayama

[0049] The Office rejects claim 27 based on similar rational as that set forth in the rejection of claims 1 (*Office Action*, pp.4 and 8-9). Applicant respectfully submits that based on argument similar to those presented above in response to the rejection of claim 1, Katayama does not disclose all of the claimed elements and features of claim 27. For example, Katayama does not show or disclose "[a]n embedded-signal detection system comprising a single embedded-signal detector configured to receive an omnibus mixed signal which includes multiple input signals

that have been received from multiple different sources and mixed together, wherein when the omnibus signal is received by the detector it is unknown whether at least one of the input signals includes an embedded signal therein, and wherein the detector is further configured to concurrently test the multiple input signals of the omnibus signal as a single continuous stream which is to be examined for the presence of an embedded signal, to determine if at least one of the multiple input signals of the omnibus mixed signal includes an embedded signal therein", as recited in claim 27. For the sake of brevity, Applicant has not repeated the arguments.

[0050] Accordingly, claim 27 is allowable over Katayama for at least these reasons, and Applicant respectfully requests that the §102 rejection be withdrawn.

[0051] **Claims 29 and 34-36** are allowable by virtue of their dependency upon claim 27 (either directly or indirectly). Additionally, some or all of claims 29 and 34-36 may be allowable over Katayama for independent reasons.

Dependent Claims

[0052] In addition to its own merits, each dependent claim is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each dependent claim where its base claim is allowable.

Conclusion

[0053] All pending claims are in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the application. If any issues remain that prevent issuance of this application, the Office is urged to contact the undersigned attorney before issuing a subsequent Action.

Respectfully Submitted,

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